Customer No.: 31561
Application No.: 10/709,036
Docket No.: 12468-US-PA

REMARKS

Present Status of the Application

The Advisory Office Action remains rejections on claims 1-7. In Final Action, claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naumov et al. (U. S. Patent 6,875,950; hereinafter Naumov) in view of Girard et al. (U. S. Patent 6,146,813; hereinafter Girard). In addition, claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naumov in view of Girard and further in view of Manginell et al. (U. S. patent 6,171,378; hereinafter Manginell). Claims 1-7 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussions

The Advisory Action states that *lasers which are capable of both annealing and trimming and other processes are well known in the art, and the instant claimed apparatus broadly describes a "laser annealing apparatus"* (*Emphasis added*).

Applicants respectfully traverse the rejections for at least the reasons set forth below.

1. As previously mentioned, the claimed invention has functionally defined the structure being different from the prior art. The laser-generating module of the present invention is defined to operate the annealing on the amorphous silicon. As can be understood by the ordinarily skilled artisan, the claimed laser will definitely not cut the amorphous silicon. ***If the trimming laser of Naumov or the ablating laser of Girard (col. 15, lines 1-14) is used in the***

present invention, the amorphous silicon is then cut and destroyed. Therefore, the annealing laser in the claimed apparatus is functionally structural difference from the prior art.

Further, in the present invention, the laser annealing energy is dynamically adjusted according to the measured resistance of the annealed silicon, which is changing from amorphous silicon to the polysilicon with varying sheet resistance. According to the measured resistance, it can tell how is the transforming situation for the amorphous silicon being currently transformed into polysilicon. The laser annealing energy is then properly adjusted to have the sufficient annealing energy to anneal amorphous silicon but not affect the polysilicon, which has been currently transformed.

In other words, the laser energy is set to anneal the amorphous silicon to the polysilicon but not to cut the amorphous silicon. Further, the laser energy is varying, according to the measured resistance.

2. In general, Naumov and Girard doe not specifically disclose the disclosed laser can be used to anneal amorphous silicon. As can be understood in ordinary skill, the laser machine for cutting/trimming electronic device can not be directly used to anneal the amorphous silicon into polysilicon as recited in claimed invention.

It should be noted that a personal judgment can not be involved in considering patentability.

3. In Re Naumov, as previously discussed, the laser is used to trim the untrimmed elements

on the panel 540 (FIG. 5; col. 14, lines 57-63) or used to have a trim cut (ablation) 1120 on other passive element (Fig. 11; col. 22, lines 21-25). Further, ***Naumov does not vary the power of laser once the power is set*** (col. 15, lines 49-63). Therefore, Naumov does not disclose the ***resistance-measurement module*** of the present invention to measure the resistance of the annealed silicon, so as to proper adjust the laser energy.

In other words, during the trimming process of Naumov, the laser energy is ***set to a fixed energy density to cut material***. This laser module is different from the annealing laser module of the present invention, in which the laser energy density is varying according to the sheet resistance.

Naumov is functionally different from the claimed invention. Alternatively, Naumov is nonanalogous to the present invention about annealing amorphous silicon in fabricating semiconductor device.

4. In re Girard, again, the laser is used to carbonization to form the shunt. As shown in Fig. 5 (col. 7, lines 52-57), the radiant energy source 62, provided by the laser, is set to have carbonization of the exposed surface 64 while leaving the leads 60 unaffected. Apparently, the laser is not used for annealing amorphous silicon into polysilicon. The radiant energy source 62 is set to a fixed level without changing. ***In order to not affect the leads, the leser energy is set to be just below the ablation threshold during carbonization (col. 15, lines 1-2)***. The laser energy is not changed.

Further, since carbonized surface layer 64 of the polyimide substrate 54 is conductive, it can

provide a discharge pathway (col. 7, lines 58- 61). However, the carbonized surface 64 can be removed by applying more fluence of radiation (col. 8, lines 4-7).

Girard is functionally different from the claimed invention. Alternatively, Girard is nonanalogous to the present invention about annealing amorphous silicon in fabricating semiconductor device.

For at least the foregoing reasons, Applicants respectfully submit that independent claim 1 patently defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 2-7 patently define over the prior art references as well.

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CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-7 of the invention patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

Date :

Belinda Lee
Registration No.: 46,863

Jianq Chyun Intellectual Property Office
7th Floor-1, No. 100
Roosevelt Road, Section 2
Taipei, 100
Taiwan
Tel: 011-886-2-2369-2800
Fax: 011-886-2-2369-7233
Email: belinda@jcipgroup.com.tw
Usa@jcipgroup.com.tw